

### **REMARKS/ARGUMENTS**

In the specification, the paragraph bridging pages 11-12 and the paragraph on page 16, lines 1-13 were amended to delete hyperlinks. The paragraph bridging pages 339-40 was also amended to include the generic name of Triton® X-100, Triton® X-114 and Thesit®.

Claims 5, 9, 12-14 and 81-84 remain pending in this application. Claims 6-8, 30, 33, 78-80 have been canceled without prejudice to pursuing these claims in a later application(s). Claims 5, 9, and 81-84 have been amended herein. Support for these amendments can be found on pages 66-67 of the specification and in Tables 8A-8C. No new matter has been added.

### **Information Disclosure Statement**

The Examiner stated that references C389-C391, as submitted in connection with the information disclosure statement (IDS) filed on September 18, 2002, were not considered because no date of public availability was listed on the IDS.

In response, Applicants are submitting herewith a revised IDS that includes the publication dates for C389-C391.

### **Oath/Declaration**

The Examiner stated that the Oath/Declaration was defective because the Examiner cannot find a signature for inventor Yi Lui.

In response, Applicants note that with the correction of inventorship dated April 26, 2004, Yi Lui was deleted as an inventor of the invention claimed in the instant application. Accordingly, the declaration submitted on October 11, 2002 complies with 37 CFR 1.63.

### **Specification/Informalities**

The Examiner stated that the title of the invention is not descriptive. In response, Applicants amended the title to recite: "Nucleic Acid Encoding a Polypeptide Homologous to a Potassium Channel Protein."

The Examiner further stated that the application contains improper reference to hyperlinks. In response, Applicants deleted all hyperlinks.

The Examiner requested that Applicants properly identify all trademarks in the present application. In response, Applicants identified all trademarks referenced in the application and made the appropriate corrections.

### **Rejection Under 35 U.S.C. §101**

The Examiner rejected claims 5-10, 12-14, 30, 33, and 78-84 under 35 U.S.C. §101 as not supported by either a specific and substantial asserted utility or a well-established utility. More specifically, the Examiner argues that utility cannot be established based on homology between NOV8 and TASK, an acid-sensitive potassium channel protein.

In response, Applicants respectfully submit that utility of the presently claimed invention is not premised solely on homology data, but rather, is based upon the results of expression studies which demonstrate that NOV8 can be used *inter alia* as a diagnostic marker for the detection of colon, thyroid, breast, and bladder cancer in a sample. (See p. 437, lines 13-19). In support of the Applicant's asserted utility, Applicants direct the Examiner's attention to the expression studies described on pages 424-438 of the specification.

Specifically, Applicants conducted expression studies involving normal and cancerous cell lines to determine whether NOV8 was upregulated in cancer cell lines. These studies demonstrate that NOV8 is expressed at a higher level in colon, thyroid, breast and bladder cancer samples compared to normal adjacent tissues. (See p. 437, lines 13-16). In view of these results, Applicants teach that NOV8 can be used as a diagnostic marker for identifying cancers in which NOV8 is differentially expressed (p. 437, lines 16-19).

The use of NOV8 as a diagnostic marker for cancer is a specific and substantial asserted utility that satisfies the requirements of 35 U.S.C. §101. Accordingly, Applicants respectfully request withdrawal of this rejection.

**Rejection Under 35 U.S.C. §112, First Paragraph—Enablement Requirement**

The Examiner rejected claims 5-10, 12-14, 30, 33, and 78-84 under 35 U.S.C. §112, first paragraph as non-enabled. Specifically, the Examiner argued that because the claimed invention is not supported by either a specific for substantial utility, one skilled in the art would not know how to use the claimed invention.

Applicants respectfully disagree. As explained above, the specification discloses and describes the use of NOV8 to detect colon, thyroid, breast and bladder cancer in a sample.

In view of the above, one skilled in the art would know how to use the claimed invention. Accordingly, Applicants respectfully request withdrawal of this rejection.

**Rejections Under 35 U.S.C. §112, Second Paragraph—Definiteness Requirement**

The Examiner rejected claims 7, 10, 78-80 and 82-84 under 35 U.S.C. §112, second paragraph for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

First, the Examiner argued that claims 7 and 78-80 are indefinite because “it is unclear as to how a nucleic acid that encodes SEQ ID NO: 24 can simultaneously encode a variant of SEQ ID NO: 24.” The Examiner further argued that claim 10 is indefinite in the recitation of “stringent conditions” and “complement.”

Although Applicants do not agree with the Examiner’s position, in the interest of furthering prosecution, Applicants have canceled claims 7, 10 and 78-80, thus obviating the Examiner’s rejections.

The Examiner then argued that claims 78-80 and 82-84 are indefinite as claim 5 (from which claims 78-80 depend) and claim 81 (from which claims 82-84 depend) recite open claim language, (i.e., “comprising”), it is unclear as to whether the recited positions are meant to be limited to those nucleotide/amino acid positions of SEQ ID NO. 23/24, respectively.

As stated above, claims 78-80 have been canceled. Claim 81 has been amended to clarify that the recited positions are meant to be limited to those amino acid positions of SEQ ID NO. 24. Specifically, Applicants deleted the term “comprising” immediately preceding SEQ ID NO: 24. Amended claim 81 recites:

“An isolated nucleic acid molecule comprising a nucleic acid sequence encoding a polypeptide comprising an amino acid sequence that differs by a single amino acid residue from an amino acid sequence of SEQ ID NO: 24.”

In view of the above, Applicant respectfully requests withdrawal of this rejection.

**Rejections Under 35 U.S.C. §112, First Paragraph—Written Description Requirement**

The Examiner rejected the claims under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

First, the Examiner argues that claims 78-80 and 82-84 are not supported by the specification and claims as originally filed. The Examiner states:

“It is noted that the specification and claims as originally filed only provide support for the recited nucleotide positions of SEQ ID NO: 23 (not a nucleic acid comprising SEQ ID NO: 23) or a nucleic acid encoding a polypeptide having the amino acid sequence of SEQ ID NO:24 (not a nucleic acid encoding a polypeptide comprising SEQ ID NO: 24)” (Office Action, p. 10).

In response, Applicants amended claim 81, from which claims 82-84 depend, to delete the term “comprising” immediately preceding SEQ ID NO: 24.

The Examiner further argues that the claims and specification as originally filed fail to support glutamine at position 75 as recited in claim 82. Claim 82 has been amended to delete reference to glutamine, thus obviating the Examiner’s rejection.

The Examiner further argues that claims 6-7, 10, and 81-84 are overly broad, and thus not supported by the specification. Specifically, the Examiner argues:

“In this case, the specification discloses a single representative species of the claimed genus...As such the disclosure of a single representative species is insufficient to be representative of the attributes and features of *all* species encompassed by the claimed genus of polynucleotides.” (p. 12, *emphasis in original*).

In the interest of furthering prosecution, Applicants canceled claims 6-7 and 10.

With respect to claims 81-84, Applicants respectfully submit that the amended claims satisfy the written description requirement. The Examiner’s rejection, which relates to genus claims, is not applicable to amended claims 82-84, as these claims are

species claims that relate to a single variant of SEQ ID NO: 24. Support for these claims can be found in Table 8C.

Although claim 81 is a genus claim in that it relates to more than one variant of SEQ ID NO: 24, Applicants respectfully submit that this claim is supported by the specification. The Examiner asserted that, "the specification discloses only a single representative species of the claimed genus." Applicants respectfully disagree. Applicants describe three variants of SEQ ID NO:24 in Table 8C, all of which presumably have the same function as NOV8. To be entitled to a genus claim, Applicants are not required to describe every member of the genus. Rather, possession of a genus claim merely requires the description of a representative number of species. Applicants respectfully submit that they have demonstrated possession of the genus described in claim 81 through the description of a representative number of species in Table 8C.

In view of the above, Applicants respectfully submit that the amended claims are adequately described in the specification, and thus satisfy the written description requirement. Accordingly, Applicants request withdrawal of this ground of rejection.

**Rejections Under 35 U.S.C. §112, First Paragraph, Enablement Requirement**

In paragraph 16 of the Office Action, the Examiner rejected claims 7, 10, 30, 33, 81 and 83-84 under 35 U.S.C. 112, first paragraph as non-enabled. The Examiner argued that undue experimentation would be required to make and/or use the entire scope of the claimed invention. Specifically, the Examiner stated:

"...the specification, while being enabling for a nucleic acid encoding SEQ ID NO: 24 and a composition comprising a nucleic acid encoding SEQ ID NO: 24, it does not reasonably provide enablement for the broad scope of claimed variant polynucleotides (claims 6-7, 10, 81, 83-84) and pharmaceutical compositions (claims 30-33)....It is the examiner's position that undue experimentation would be required for a skilled artisan to make and/or use the entire scope of the claimed invention."

With respect to claims 7, 10, 30 and 33, while Applicants do not agree with the Examiner's rejection, in the interest of furthering prosecution, these claims have been canceled.

Applicants respectfully disagree with the Examiner's rejection as it relates to claims 81 and 83-84. With respect to these claims, the Examiner's non-enablement position is premised on the following interpretation of claims 81, 83-84:

"Regarding the interpretation of claims 81, 83-84, it is noted that if alanine is at position 202 or if leucine is at position 205, then the single amino acid substitution must be at some other unidentified amino acid as these residues are present in SEQ ID NO: 24..."

In response, Applicants amended claims 83-84 to clarify that the amino acid substitution at positions 202 and 205 is threonine and proline, respectively. Support for these amendments can be found in the specification on page 67 in Table 8C. Since the amended claims relate to a specific amino acid substitution that was described in the specification, Applicants submit that these claims are fully enabled, and thus satisfy the requirements of 35 U.S.C. 112, first paragraph.

In view of the above, Applicants respectfully request withdrawal of this rejection.

#### **Rejection Under 35 U.S.C. §102**

The Examiner requested that Applicants identify a provisional application that provides support for the claimed invention. In response, Applicants submit that support for NOV8 can be found in U.S.S.N. 60/268,221 filed on February 12, 2001 (CURA-569).

The Examiner rejected claims 7 and 10 under 35 U.S.C. §102 as being anticipated by U.S. Patent Application No. 2002/0137202 and GENBANK Accession Number AI739096, respectively.

Although Applicants do not agree with the Examiner's arguments, in the interest of furthering prosecution, these claims have been canceled, thus obviating this rejection.

#### **CONCLUSION**

Applicant respectfully requests that the remarks made herein be entered and made of record in the file history of the present application. Applicant respectfully submits that the pending claims are in condition for allowance. If there are any questions regarding these amendments and remarks, the Examiner is encouraged to contact the undersigned at the telephone number provided below.

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Respectfully submitted,

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